FERRANTI

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MP MASTER
MA23423

105/CA 2/40

Special Test Equipment

105/CA 2140

WORKSHOP POWER SUPPLY

TYPE 15909

CONTRACT EF/B/05611

Ferranti Limited,
Communications and Control,
Silverknowes,
Edinburgh EH4 4AD

HB/CC/ML/105
July, 1969

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1. DATA SUMMARY FOR WORKSHOP POWER SUPPLY TYPE 15909

1.1 Input: 240V ± 10%, 50Hz ± 10%, Single phase.

1.2 Outputs: Primary Converter, 48.0 ± 1.0 volts, adjustable

Secondary Converter, + 20.0 volts, - 20.0 volts, - 10.0 volts) ± 5%, adjustable

- 745 ± 0.3V, adjustable
- 1145 ± 0.5V, but depends on -745V setting.

6.5 volts at 1A (raised -745V w.r. to earth)

1.3 Dimensions: 17.125" x 19.375" x 14"

Weight 86 lbs.

1.4 Accessories Supplied: Interconnecting Cables

a) Workshop Power Supply to Primary Converter (48V)

b) " " " to Transmitter (H.V.)

c) " " " to Transmitter (L.V.)

d) " " " to Receiver

2. GENERAL

The unit is designed to supply complete units or sub-units in the Type 14000 series of equipment and can power simultaneously the equivalent of 2 transmitters (klystron or solid-state) and 2 receivers plus associated control and supervisory circuits. Waveguide switches where applicable may also be tested.

The unit is built into an Imhof Instrument Case Type 609/12 (see layout drawing 15909) and consists of an upper half containing a primary stabiliser and a lower half containing a secondary converter stabiliser. Built-in meters, indicator lamps and switches show clearly the power supply state.

Caution: The Primary Converter (upper unit) weighs 45 lb and great care should be taken when removing it from the cabinet.

3. DESCRIPTION

3.1 Primary Stabiliser Type 15907

3.1.1 General

Reference should be made to drawings 15907, sheets 1 to 4. A Gresham power unit Type GX 60/10 is built onto the front panel of the upper unit. 240 volts a.c., 50Hz is fed via switch SA and fuse FS1 (5 amps slow blow or 10A ordinary) into terminals L and N. Terminal E is earthed to the chassis. Neon lamp ILP-2 indicates the presence of 240 volts a.c. at terminals L and N.

48 volts d.c. appears between +OP and -OP. Local sensing is used on the power unit and +OP is connected to +Amp and -OP to -Amp. Total output current from the supply passes through FS2 (10 amps) and M1 (10 amp full scale). ILP-1, which is not controlled by switch SB, indicates that FS2 is intact. The output 48 volt d.c. supply is switched by SB to Belling Lee terminals TP1 and TP2, directly connected to Plessey socket SKTA (pins A and B positive, C and D negative) and via tag block TSA to Secondary Stabiliser Type 15908.

The Gresham power unit has an overload trip circuit which can be preset to the desired tripping current. This circuit will automatically reset the output to 48 volts when the overload is removed. Output impedance and ripple from the unit are of an adequately low order for the test work required.

3.1.2 Circuit Description (see diagram 14432)

Incoming a.c. is transformed and rectified, and is then smoothed with a simple capacitor filter before passing through a set of eight paralleled regulating transistors to the output terminals. The voltage at the output is compared with a reference in the amplifier printed card. The difference is fed, after amplification, as a control signal to the series transistors.

The/

The reference Zener diode and transistor combination (MR6/VT5) are matched, equal and opposite temperature coefficients being chosen for the zener and base emitter junction voltages. The fraction of output voltage across RV2, R15 then determines the "correction" output of VT5, this being amplified via VT1, 2 and 6 to drive the bases of the series regulators VT7A to H. The overload circuit VT3 is operated from the voltage developed across VT7A emitter resistor and is preset to limit the current which can be drawn to about 120% of normal rated load. If a short circuit is applied, the output current is limited to about 20% of rated load.

3.2 Secondary Stabiliser Type 15908

3.2.1 General

Reference should be made to drawings 15908, Sheets 1 to 5. This unit consists of a d.c. - d.c. converter/stabiliser built on to a front panel containing switches, sockets, lamps, fuses and a meter.

48 volt d.c. is fed into the secondary converter via TSA-3 and TSA-2. The positive supply from TSA-3 passes via fuse FS1 (3 amp. slow blow) directly to the input terminal on the low voltage panel of the converter. The high voltage panel receives 48 volt +ve via ON/OFF switch SA, the state of the switch being indicated by ILP-1 (RED).

The following outputs are obtained:-

a. Low Voltage Section

i. +20 volts ±5%

Current capability 1.5 amp, at the following points:-

Belling Lee terminal OP1 via FS3 (2 amp) and ON/OFF switch SB. Note that ILP/2 indicates the state of SB.

Plessey socket SKTC pins A and B via switch SD.

Plessey socket SKTA pin A via switch SE.

ii./

ii. -10 Volts ± 5%

Current capability 1.0 amp, at the following points:-

Belling Lee terminal OP3 via FS4 (2 amp.) and ON/OFF switch SC. Note that ILP-3 indicates the state of SC.

Plessey Socket SKTC pin D via switch SD. Note that ILP-4 indicates the state of SD.

Plessey socket SKTA pin D via switch SE. Note that ILP-5 indicates the state of SE.

Note: On versions of this power unit intended for test of broad band transmitters, the 48 volt supply is also available on transmitter socket SKTC pin E +ve, pin F -ve for use in Wide Band Modulator Type 14055. This supply is also switched by SD.

ii. -20 volts ± 5%

The -20 volts supply, used only for the local oscillator in a receiver, is provided from a separate sealed module built into the Primary Converter shelf.

The current capability of the module is 200mA (The normal L.O. consumption is approx. 100mA) at the following points:-

Belling Lee terminal OP4 via switch SF, indicated by ILP/6.

Plessey socket SKTA pin B via switch SE.

b. High Voltage Section

Klystron supplies are brought out to a 6-way Plessey socket SKTB and also to monitor points to enable the voltages to be checked by an external meter.

An internal meter M1 (0-200 mA) indicates the klystron cathode current being drawn from the supply. Outputs are as follows:-

i. 0 Volts

SKTB pin C and MP1.

ii./

ii. -745 Volts

SKTB pin B and MP2.

iii. -1,145 Volts

SKTB pin D and MP3.

iv. Heater Supply

Floating 6.5 volts at 1 amp, fused by FS2, 1.5 amp slow blow. Available, +ve at SKTB pin A and MP4, -ve at SKTB pin E and MP5.

v. Chassis Earth, SKTB Pin F

Note: All these supplies are switched on by connecting 48 volts +ve to the high voltage section of the converter via switch SA. ILP-1 (RED) warns that high voltages are on. The monitor points are guarded by a perspex panel to avoid the risk of shocks and accidental shorting of the -745 volt and -1,145 volt lines.

3.2.2. Circuit Description (See diagram 15908)

a. Low Voltage Section

i. Converter Circuit

Primary Converter 15907 applies 48 volts d.c. via supply fuse FS1 (3 amp) to a conventional 2 transformer push-pull transistor inverter circuit (T1, T2, Q1, Q2, R1 to R5, D1). This circuit produces square wave a.c. at a frequency of approximately 1 kHz. T2 is a linear output transformer with a conventional "C" core and a good frequency response. T1, with a core of square loop material, ensures rapid switching of Q1 and Q2 and, since it is only required to handle transistor base powers, is of small dimensions. The number of turns on the primary of T1, along with the feed back resistor R2, determine the time to reach core saturation and hence the frequency of the inverter. R1 and D1 provide bias to ensure that the inverter will always start oscillating under load conditions.

ii./

ii. +20V Rectifier/Stabiliser Circuit

Transformer T2 has 2 output windings. Terminals 4 and 6 apply square waves to rectifier bridge D2 to D5 and approximately 25 volts d.c. is developed across C1; C23 greatly reduces the spike amplitude normally associated with high speed switching. 25 volts is stabilised to 20 volts by Darlington connected series transistors Q3 and Q4. The control transistor Q7 is held at constant emitter potential by zener diode ZD1 fed via R9. A sample of the output voltage is fed to the base via the network R11, R12, R13, RV1 and the output is set up by adjusting RV1. C3 is chosen to prevent loop instability and C21 reduces the high speed transients to an acceptable level.

iii. -10V Rectifier/Stabiliser Circuit

Secondary 2 on T2 applies from terminals 5 and 7 a square wave to bridge rectifiers D6 to D9. Approximately 14 volts d.c. is developed across C2. The circuit performance is identical to that described for the 20 volt line with the values adjusted to give a 10 volt output. Component functions are as before and detailed description is therefore unnecessary.

iv. Protection

No short circuit protection is built into these stabilisers but conservative rating of transistors ensures that no damage will be done by momentarily short-circuiting their outputs.

b. High Voltage Section

i. Converter, and Cathode Rectifier Circuit.

Primary Converter 15907 applies 48 volts d.c. to a conventional 2 transformer push-pull transistor inverter similar to that described in paragraph 3.2.2.a.i. above (T3, T4, Q9, Q10, R17 to R21, D10). As before, the frequency is approximately 1kHz. Operation of the circuit is exactly as in paragraph 3.2.2.a.i.

Transformer/

Transformer T4 has 4 secondary windings. Secondary 1, terminals 10 and 11, also has taps at +2½%, terminal 12, and +5%, terminal 13. The correct tap to choose is the one that leaves a small voltage (not less than 5 volts) across the series stabiliser Q12 when the input voltage has fallen to 47 volts and the power supply is delivering 150 mA at -745 volts. Terminals 10 and 11 apply a high voltage square wave (approximately 1,600 volts peak to peak) to a rectifier bridge D11 to D18 and approximately 780 volts d.c. is developed across C9 and C10 in series. Because of high peak inverse voltages, 2 diodes in series are required in each bridge arm. For the same reason C9 and C10 (each 450 V d.c. working) have to be connected in series. R23, R24 ensure that the voltage across the capacitors is divided equally between them and C5 reduces the spike amplitude associated with high speed switching.

ii. Cathode Stabiliser Circuits

The d.c. output is stabilised to 745 volts by series transistor Q12 which is driven by Q11. The collector emitter voltage rating of Q12 can be exceeded during switch-on and switch-off transients, and to prevent damage a 56 volt zener ZD3 is connected across Q12. This power zener (20 watts rating) virtually short circuits Q12 at voltages greater than 56 volts.

Reference voltage for the supply is provided by ZD5 and ZD6 in series to give 16 volts approximately. To ensure minimum variation of zener current, precision resistors are used at R51, R53, R54. All potentiometer chains use wire-wound resistors with very low drift coefficients and excellent long term stability. (R27, R28, R49, R52.) Also the effect of drift due to potentiometer RV3 is minimised by connecting it in parallel with R50. The error amplifier consists of 2 long tail pairs Q17, Q20, and Q18, Q19 with both pairs connected between zero and -745 volts. To prevent base current variation in Q17 and Q20 affecting the potentiometer ratio (R27, R28) the emitter current/

current is reduced to 20 uA approximately, necessitating a large value of tail resistor. This is achieved by connecting seven 4.7 MΩ in series (R31 to R37). In the second stage long tail pair a higher emitter current is permissible, and R45 plus R46 (3.2 MΩ total) is suitable. To avoid direct ripple injection into the loop, the emitter of Q11 is fed from a separate zener supply R61, ZD7. Loop stability is maintained by C13 and C14 in series across the output together with spike reducer C15 in parallel. R55 and R56 equalise capacitor voltages as before.

iii. Reflector Rectifier Circuit

Secondary 2 terminals 14 and 15 apply a square wave of approximately 860 V pk-pk to bridge rectifier D19 and D22 and approximately 430 volts d.c. is developed across C11. C6 is a high frequency transient reducing capacitor, while R25 provides a current bleed path for C11 and prevents voltages in excess of the capacitor rating being developed in the off load condition.

iv. Reflector Stabiliser Circuit

The output voltage is stabilised to 400 volts by series transistor Q14 which is turn is driven by Q13 from long tail pair Q15 and Q16. ZD4 protects Q14 as before. To avoid the difficulty of providing another reference voltage the -745 volt line itself is the reference and the 400 volts is stabilised with respect to -745 volts giving an added output of 1,145 volts (745 + 400).

The accuracy of the 400 volt supply depends critically on resistors R26 and R44. These are precision wire-wound again and selected to within 0.01% of nominal value. A low value of tail current as before is provided via R38 to R43 in series. C12 is chosen to give adequate loop stability with R58 providing a current path and C16 reducing spike content. The 1,145 volt supply should be within ± 0.5 volt and much be checked with a digital voltmeter - see paragraph 4.2.1.

v./

v. Heater Supplies

Secondary 4, terminals 7,8,9 provide a square wave to full wave rectifiers, D25 and D26 which give across C8 an unstabilised d.c. heater voltage of approximately 6.5 volts. R63 provides a current path for C8 and prevents the voltage rising above the capacitor working voltage in the off-load conditions.

vi. Protection

The heater supplies are individually fused and, once the klystron is operating, the fuse is at a potential of -745 volts. The fuse protects the supply against the possibility of a klystron heater going short circuit. To avoid further complexity the only protection circuits on the high voltage stabilisers are the shunt zeners ZD3, ZD4. Care must be taken therefore to guard against high voltage flashover, momentary overload or short circuits when working with opened transmitters and/or converter stabilisers.

4. SETTING UP AND ROUTINE MAINTENANCE

4.1 Primary Stabiliser 15907

No routine maintenance is required. Setting-up presets on the Gresham power unit is as follows:-

4.1.1 Output Voltage

With RV3 in mid-position and Secondary Converter Stabiliser 15908 loaded by Dummy Load 15901, adjust RV2 to make the output voltage approximate the required value as read on the Digital Voltmeter. Adjust to the exact voltage using fine control RV3. Note that the transformer taps already selected by Ferranti should not be disturbed.

4.1.2 Overload Circuit

Adjust RV1 so that the output voltage just starts to fall when the load current drawn from the output is increased to, say, 10 A.

4.2 Secondary Stabiliser 15908

Note that the six core cable connecting upper and lower units in 15909 is sufficiently long to enable either unit to be slid on to the bench for detailed test or repair.

4.2.1 Setting-up the Output Voltages

a. +20 V, -10 V and -20 V Supply Lines

With 48 V fed in from Primary Stabiliser 15907, potentiometers RV1 and RV2 are adjusted to give +20.2 and -10.1 volts respectively at output terminals when loaded with Dummy Load 15901.

The -20V line is fed directly from a.c. mains and its level is adjusted using the potentiometer within the power module.

b. High Voltage Lines

The transformer tap on T4 high voltage secondary is first selected as described in paragraph 3.2.2.b.i above. Links 67, 147, 146 and 44 are then connected as necessary/

necessary to enable RV3 to set the output voltage to -745.0 volts on load. The digital voltmeter, Dynamco DM2022 or Solartron LM1440.3, is essential for this job.

After setting RV3, the reflector output line should be checked to read -1,145.0 ±0.5 volts.

Warning: Transistors Q1, Q2, Q9, Q10 may be fitted with beryllium oxide insulating washers which have exceptional heat conducting properties. To aid recognition, these are coloured light blue. Dust or fume from this material is, however, highly toxic if inhaled, and some reaction is also possible from handling without gloves when one's skin is cut or broken. In normal use there is no danger, but on no account should be material be crushed, ground or filed. Broken washers should be wrapped in polythene and treated as poisonous scrap.

4.3 General Check List

N.B. Figures are guides only, not hard limits.

4.3.1 Input Current to Secondary

48 ±1V :~ 5 A from Primary 15907 when Secondary 15908 fully loaded with Load 15901 and all parts working normally.

4.3.2 Miscellaneous Notes

a. The normal audible notes from the converters are each around 1kHz.

b. Fuse FS1 protects against short circuits in the low voltage converter/transformer combination, and can be used as a switch to immobilise the +20 V, -10 V circuits if required. The -20V output is separately protected (within the module).

c. Fuse FS2, protects against sustained shorts or partial shorts on the klystron heater line.

d. The +20 V, -10 V and -20V circuits will not normally be damaged by temporary short circuit loads, but note that the +20V and -10V terminals are further protected by fuses FS3 and FS4.

e./

e. Protective zeners ZD3, ZD4 (in the high voltage sections) usually fail if any attempt is made to draw excessive load current from these lines, so preserving Q12, Q14 respectively.

4.3.3 Functional Checks

a. Low Voltage Section

When either of the +20V and -10V do not vary with RV1 and RV2 respectively and the voltage(s) is (are) high by, say, 3V, the stabiliser(s) is (are) short circuit. Failure of the -20V module requires the sub-unit to be returned for factory repair.

When RV1 and RV2 are set as in paragraph 4.2.1.a (at maximum load currents of 1.5 and 1.0 A respectively) niether a 3:1 change in load nor a 47 to 49 V change in input (applied separately) should alter either output voltage by more than 0.3V.

Output ripples less then 1 mV pk-pk are normal on +20 V, -10V and -20V. Output transients on the +20V and -10V lines should be less than 500 mV pk-pk, but this depends critically on test gear used, earthing, etc

b. High Voltage Section

Note that voltages generated in this part of the unit are high and therefore dangerous.

If the cathodeline shows no change (on D.V.M. DM.2022 or LM1440.3) as RV3 is varied, and/or if the output is in excess of -760 V at a load of, say, 75 mA, the stabiliser is unserviceable. Check Q12,/ZD3 for short circuit by AVO8 and replace as necessary. Similarly for reflector line and Q14/ZD4.

Typical transistor voltages in a working unit are, with respect to chassis, as follows:-

/

Component	Emitter	Base	Collector	
Q11	+ 0.5	+ 3.0	+ 3.6	volts
Q12	+38	+ 0.5	0	"
Q17	- 4.0	-14.0	-14.5	"
Q18	0	- 4.0	- 5.0	"
Q19	+ 3.0	- 4.0	- 5.0	"
Q20	- 4.0	-14.0	-14.5	"

With RV3 set as in paragraph 4.2.1.b. the change in cathode or reflector volts for a change from 75 to 150 mA on Dummy Load 15901 should normally be less than 0.1 volts.

Note: Since no preset is provided for the reflector line the -1,145 V value cannot be adjusted. It is fixed mainly by precision resistors R26/R44 and should usually be within ±0.2 V, but can be ±0.5V. Only outside the latter limits need a fault be suspected.

With RV3 correctly set, the change in cathode or reflector volts for an input change from 47 to 49 volts should normally be less than ±0.1 volts. (Refer to paragraph 4.2.1.b for notes on tap and resistor link setting.)

Output ripples on cathode and reflector monitor points in Dummy Load 15901 are normally below 10mV pk-pk, values around 6 mV being typical. Transient "spikes" are normally below 1 volt pk-pk but, as for low voltage lines, this depends critically on the method of measurement.

FERRANTI LTD., Edinburgh TEST SPECIFICATION GROUP

TEST CERTIFICATE

FOR THE PRODUCTION TESTING OF

Ref. No.

TO SPECIFICATION No.

Unit WORKSHOP POWER SUPPLY Serial No. 104

General Assembly Drawing No. 3913/15909 Issue No. B

Circuit Diagram Drawing No. 3913/14432/15908 Issue No. A

Passed for Ferranti Ltd. [signature] Date 3-10-70

Approved ..... Date .....

Part 3 Section	Nature of Test	Spec. Limits	Test Results	Insp. Stamp Date
NOTE	ALL MEASUREMENTS OF 75mA UNLESS	TAKEN AT A LOAD CURRENT OTHERWISE STATED.		
1.	-745V OUTPUT VOLTAGE	SET TO -745·0V	-745·0V	2-10-70
1.1	-1145V .. .. (1mA LOAD)	1145V ± 1V.	-1145·2V	
	REGULATION.			
2.	DROP IN -745V LINE AT A LOAD CURRENT OF 150mA	< 200mV	< [illegible]	
	STABILISATION			
3.	OUTPUT VOLTAGE FOR CHANGE IN INPUT VOLTAGE FROM 47-49V -745V LINE.	< 200mV	< [illegible]	A. Alexander M. Smith
3.1	-1145V LINE	< 200mV	< [illegible]	

TEST CERTIFICATE

for specification No. Issue

Part Section	Nature of Test	Spec. Limits	Test Results	Insp. Stamp Date
	SPIKE AMPLITUDE			
4.	-7.45V LINE 75mA / 150mA	< 1.0V	750mV	
4.1	-11.45V LINE (150mA LOAD ON -7.45V)	< 1.0V	750mV	
	RIPPLE AMPLITUDE			
5.	-7.45V LINE 150mA	< 10mV P-P	7mV P-P	
5.1	-11.45V LINE (150mA LOAD ON -7.45V)	< 10mV P-P	7mV P-P	
	DC HEATER SUPPLY			
6.	VOLTAGE ON LOAD	6.5 - 6.7V	6.62V	2-10-70
6.1	RIPPLE VOLTAGE	< 150mV	110mV	
	LOAD CURRENT FROM 48V SUPPLY			
7.	SECONDARY LOAD 75mA	< 2.5A	1.8A	
7.1	" " 150mA	< 3.5A	2.9A	
7.2	SPIKE AMPLITUDE AT INPUT TO SECONDARY CONVERTER	< 0.5V	0.45V P-P	Alexander M. Smith.

COMPONENT LIST

REFERENCE	NAME	NO. OFF
GMB 15/1/2-101	P.C. BOARD	1
R1, R12	RESISTOR 100HMS ¼W. 5% CARBON	2
R2	RESISTOR 1K ¼W. 5% CARBON	1
R3, R4, R10, R20	RESISTOR 4.7K ¼W. 5% CARBON	4
R5	RESISTOR 10 OHMS ¼W. 5% CARBON	1
R6	RESISTOR 820OHMS ¼W. 5% CARBON	1
R7	RESISTOR 27K ¼W. 5% CARBON	1
R9	RESISTOR 2.2K ¼W. 5% CARBON	1
R11	RESISTOR 22K ¼W. 5% CARBON	1
R13, R14	RESISTOR 3.9K RWV4-K	2
R15	RESISTOR 560OHMS RWV3-J	1
R16	RESISTOR 12K ½W. 5% CARBON	1
R19	RESISTOR 6.8K ¼W. 5% CARBON	1
R21A-H	RESISTOR 100 OHMS ELECTROSIL TR5	8
R22A-H	RESISTOR 0.68 OHMS RWV4-J	8
RV1	RESISTOR VARIABLE 39K	1
RV2	RESISTOR VARIABLE 200OHMS.	1
RV3	RESISTOR VARIABLE 270Ω	1
C1	CAPACITOR 50µF. 40V	1
C3	CAPACITOR 0.01µF. 160V.	1
C4	CAPACITOR 0·001µF. 400V.	1
C5A, C5B	CAPACITOR 8000µF 100V	2
C6	CAPACITOR 400µF 100V	1
C7	CAPACITOR 0·1µF. 500V D.C.	1
C8	CAPACITOR 1000PF	1
MR1	DIODE 5D2 IRC	1
MR2	DIODE ZF 15 STC	1
MR3, MR6	DIODE ZF 6.2 STC	2
MR7, MR8	DIODE 5D05 IRC	2
MR9	BRIDGE RECTIFIER 10B 20T IRC	1
FS1	FUSE LINK 10A 1¼ x ¼ DIA.	1
VT1	TRANSISTOR, 40346	1
VT2, VT3, VT5	TRANSISTOR C407 SGS- FAIRCHILD	3
VT6	TRANSISTOR 2N3441	1
VT7A-H	TRANSISTOR 2N4347	8
T1	TRANSFORMER GMB60/10/2-5	1

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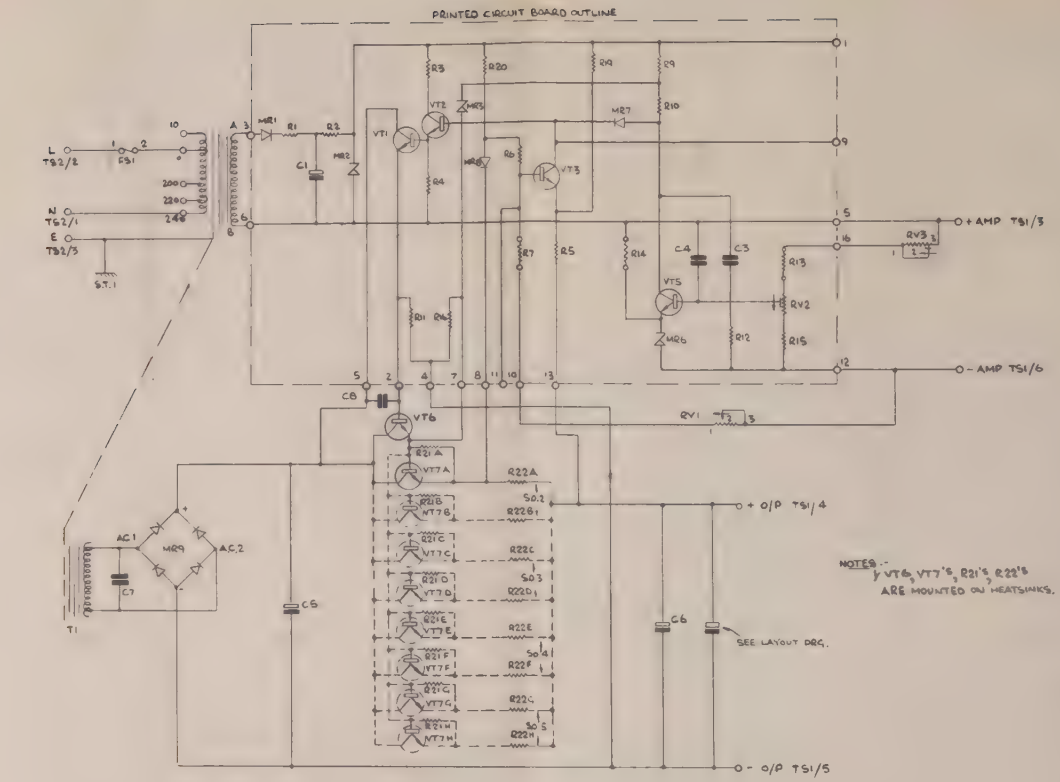


GRESHAM POWER SUPPLY
TYPE 14432

USED ON DRAWING PART LIST No.

D3913/15909

ITEM	DRAWING NO	NAME	NO OFF	REMARKS
1	D3913/15777	PANEL (FRONT)	1	
2	C3913/15789	SIDE MEMBER	1	
3	C3913/15788	SIDE MEMBER	1	
4	A3913/15784	ANGLE	1	
5	A3913/15791	ANGLE	1	
6	A3913/15778	LABEL	1	
7	A3913/15782	TUBE	4	
8	A3913/15783	ROLLER	4	
9	A3913/15792	PLATE	1	
10	B3913/14432	GRESHAM POWER SUPPLY	1	
11	B3913/16755	BRACKET	1	
12				
13				
14				
15				
16	21324-759	SCREW, CH.HD. 2BA x $\frac{3}{8}$" LG.	6	BS/A35/C20
		ST.ST. TO BS EN57 OR 58		
17	21324-761	SCREW, CH.HD. 2BA x 1" LG.	4	BS/A35/C32
		ST.ST. TO BS EN57 OR 58		
18	21324-755	SCREW, CH.HD. 2BA x $\frac{3}{8}$" LG.	4	BS/A35/C12
		ST.ST. TO BS EN57 OR 58		
19	21324-749	SCREW, CH.HD. 4BA x $\frac{5}{8}$" LG.	1	BS/A35/B20
		ST.ST. TO BS EN57 OR 58		
20	21324-747	SCREW, CH.HD. 4BA x $\frac{3}{4}$" LG.	3	BS/A35/B16
		ST.ST. TO BS EN57 OR 58		
21	21324-737	SCREW, CH.HD. 6BA x $\frac{3}{4}$" LG.	3	BS/A35/A16
		ST.ST. TO BS EN57 OR 58		
22	21301-10	NUT, 2BA, ORDINARY, ST.	10	BS/A49/C
		ST. TO BS EN57 OR 58		

TITLE	SHEET 1 OF 1 SHEETS	PART LIST FOR
PRIMARY STABILISER TYPE 15907		D3913/15907

USED ON DRAWING PART LIST No.
D913/
15909

ITEM	DRAWING NO	NAME	NO OFF	REMARKS
24	21387-445	NUTS, 4BA, ORDINARY, ST.	4	BS/A49/B
		ST. TO BS EN57 OR 58		
25				
26	21176-105	WASHERS, SPRING, SINGLE	14	BS/SP47/C
		COIL, 2BA		
27				
28	21176-104	WASHERS, SPRING, SINGLE	4	BS/SP47/B
		COIL 4BA		
29	21176-103	WASHERS, SPRING, SINGLE	3	BS/SP47/A
		COIL 6BA		
30		10-32 UNF x 5/8" LG. HEX.	4	IMHOF
		HEADED SCREWS REF. S5245		
31	21172-435	WASHER, PLAIN, LARGE, 2BA	4	BS/SP24/C
		ST.ST. TO BS. EN57 OR 58		
32				
33	21857-643	HAMMER DRIVE SCREWS, SIZE	2	GKN ART. NO.
		'00' x 3/16" LG.		4530
34		HANDLES DEE 5 1/4" CRS.	2	IMHOF
		TYPE H4		
35	25184-343	GROMMET RUBBER 1/4" I/D	1	BS/SP93/C8
36				
37		METER CONCORD RANGE	1	ANGERS
		TYPE 0155, FULL SCALE		
		DEFLECTION COIL 'B'		
		CAPTION 'A'		
		0-10 Amps.		

TITLE	SHEET 2 OF 5 SHEETS	PART LIST FOR
[illegible] STABILISER TYPE 15907		D3913/15907

A SHEET

USED ON DRAWING PART LIST No. D3913/15907

ITEM	DRAWING NO	NAME	NO OFF	REMARKS
38	25418-511	FUSE HOLDER PANEL	2.	BELLING LEE
		MOUNTING (L1382)		
39	25415-211	FUSE, ANTI-SURGE	1	RADIO SPARES
		1¼" LG. × 5A		
40	25227-215	TERMINAL, SCREW STEM,	1	BELLING LEE
		TYPE L1001/21SB RED		
41	25227-216	TERMINAL, SCREW STEM,	1	BELLING LEE
		TYPE L1001/21SB BLACK		
42	25411-415	FUSE LINK 10A	1	BELLING LEE
43				
44	25614-302	NEON INDICATOR LAMP	1	BELLING LEE
		.05W, MBC SMALL		
45				
46				
47	25463-661	TOGGLE SWITCH, SINGLE	1	N.S.F.
		THROW TYPE 7320/K2		SB
48	25464-504	TOGGLE SWITCH, SINGLE	1	N.S.F.
		THROW TYPE 8370/K8		SA
49				
50				
51	25[illegible]-[illegible]46	8 WAY SOCKET MK4, BRASS	1	PLESSEY
		Fixed Sca[illegible]/5CD		
		POWER MODULE REF No	1	BENRUS
		PC[illegible]		

TITLE	SHEET	PART LIST FOR
PRIMARY STABILISER TYPE 15907	1 OF 5 SHEETS	D3913/15907

A SHEET

USED ON DRAWING PART LIST No.
3913/
15909

ITEM	DRAWING NO	NAME	NO OFF	REMARKS
53	25625-221	LAMPHOLDER DIFFUSED	1	BULGIN
		D674/1/ORANGE		
54				
55	25615-433	LAMP MINIATURE	1	VITALITY BULBS
		LES (E5/8) 12V, 1W		LTD.
56				
57	25234-646	CABLE CLIP 5/16" DIA.	5	
		NX3		
58				
59	25421-130	5A, 3PIN ROUND PLUG	1	M.E.M.
60				
61				
		RESISTORS		
62	26134-459	RC7-H. 680K, ½W	1	R1
63	26218-341	RFH3-6. 470Ω. 6W	1	R2
64				
65				
66				
		AIR. ELECTRICAL EQUIPMENT		
67	1347-364	3 CORE 23/·0076	AS REQD	CMA 9183Y
68	1346-[illegible]	TYPE [illegible], 23/·0076 YELLOW	AS REQD	2 - 7 - Y
69	134[illegible]-352	TYPE [illegible], 23/·0076, BLUE	AS REQD	2 - 7 - B
70	134[illegible]-[illegible]	TYPE [illegible], 40/·0076, YELLOW	AS REQD	3 - 8 - Y
71	134[illegible]-332	TYPE [illegible], 40/·0076, BLUE	AS REQD	3 - 8 - B
	[illegible]1	TYPE [illegible]	AS REQD	2 - 6 - R

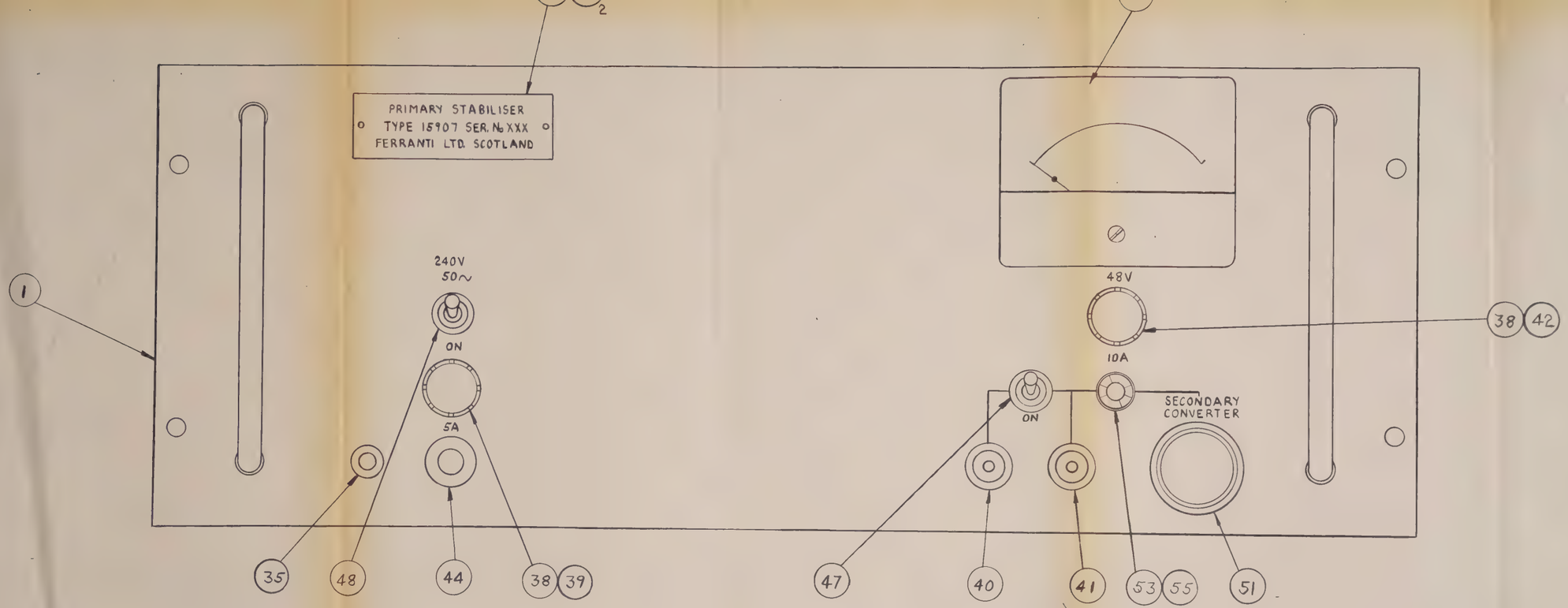
TITLE	SHEET 1 OF 5 SHEETS	PART LIST FOR
[illegible] STABILISER [illegible]		D3913/15907

USED ON DRAWING PART LIST No.

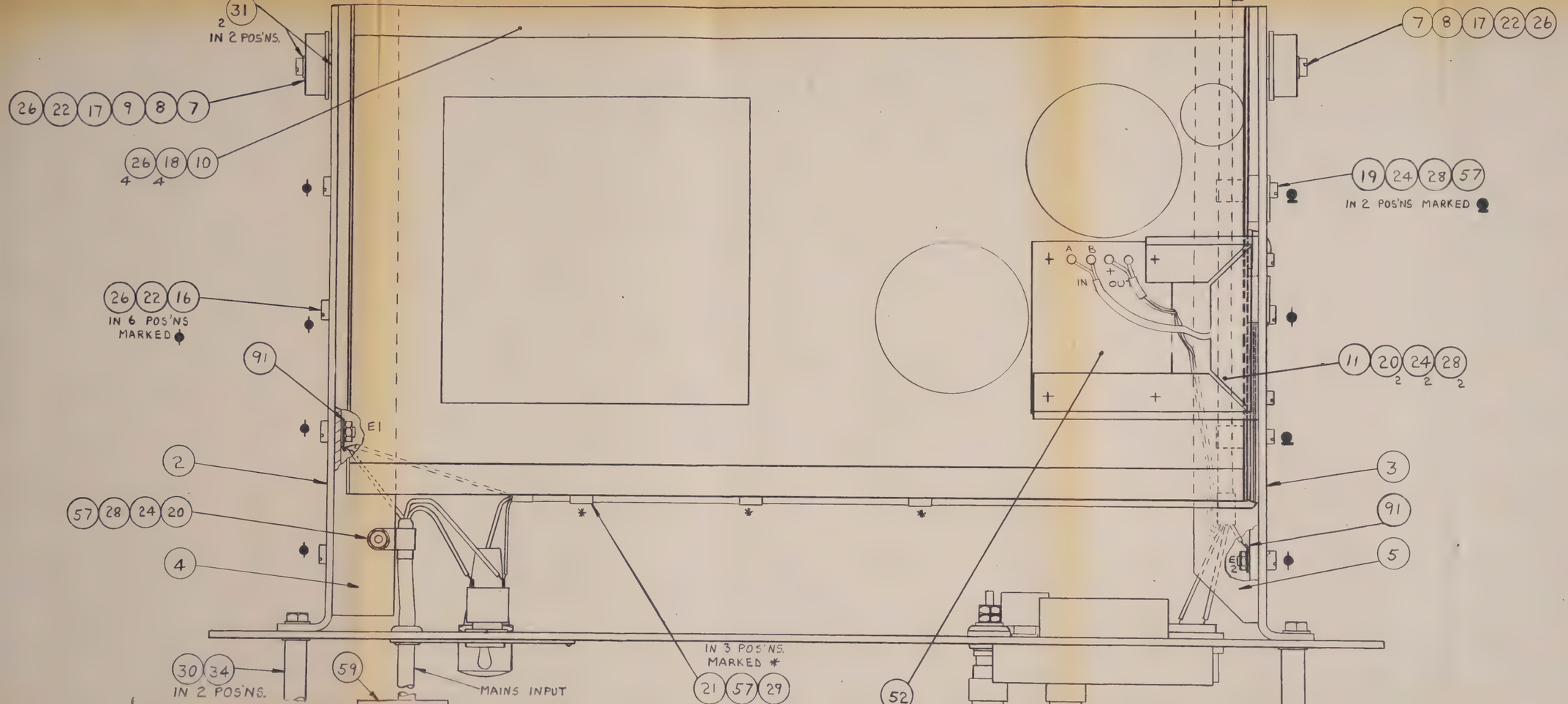
3.13'
15909

ITEM	DRAWING NO	NAME	NO OFF	REMARKS
73	1346-185	TYPE 2, 14/·0076 BLACK	AS REQD	2 - 6 - BK
74	1347-049	MIN. ELEC. CABLE 6C	AS REQD.	
75				
76				
77				
78		NYLOM CORD ·031 DIA. BLACK	AS REQD	
		SLEEVES BINDING		
79	25132-013	1·5MM I/DIA. X ½" LG. A15	AS REQD	PINK
80	25132-020	3MM I/DIA. X 1" LG. A30	AS REQD	PINK
81	25132-025	5MM I/DIA. X 1" LG. A50	AS REQD	PINK
82				
83		INSULATION SLEEVING 2 M.M. I/D. VIOLET	AS REQD	BS 2848. TYPE 3 CLASS 8ST
84				
85				
86				
87				
88	25227-701	TERMINAL TWINGRIP (RING)	7	HELLERMANN
		4BA REF. HC 294		
89	25227-901	TERMINAL TWINGRIP (QUICK	2	HELLERMANN
		RELEASE) 6BA REF. HC 490		
90	25221-172	SOLDER TAG 4BA	3	TUCKER G410
91	25221-175	SOLDER TAG 2BA	2	TUCKER G363

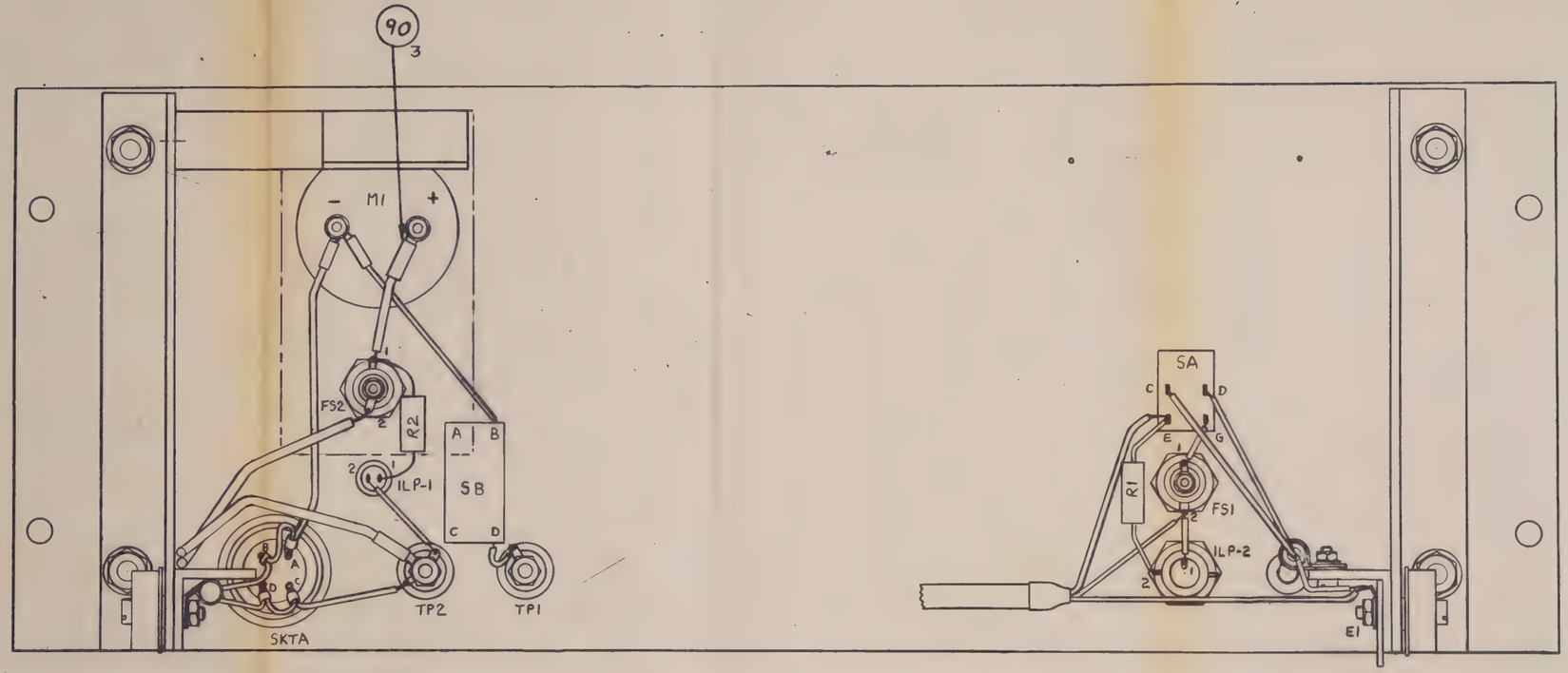
TITLE	SHEET 5 OF 5 SHEETS	PART LIST FOR
PRIMARY STABILISER TYPE 15907		D3913/15907



PRIMARY STABILISER
TYPE 15907
(SHT 1)



PRIMARY STABILISER
TYPE 15907



PRIMARY STABILISER
TYPE 1590T
(SHT.3)

FIRST USED ON DRAWING PART LIST No.

ITEM	DRG./CODE No.	DESCRIPTION & SPECIFICATION	QTY PER ASSY.	TOTAL QTY REQ'D.	REMARKS
1	C3913/14421	Board	1		Sub-As
2	B3913/14436	Board	1		Sub-Assy
3	D3913/15773	Panel (Front)	1		
4	C3913/15780	Side Member	1		
5	C3913/15779	Side Member	1		
6	D3913/14713	Panel	1		
7	D3913/14714	Panel			
8	A3913/15790	Plate			
9	B3913/16595	Channel	1		
10	A3913/14717	Bracket	2		
11	A3913/15785	Label (Ident.)	1		
12	A3913/15793	Label (Warning)	1		
13					
14					
15					
16	B3913/16600	Channel	1		
17					
18	B3913/16601	Angle	1		
19					
20					
21	A'95'26613	Insulator Disc	2		
22	A'95'26615	Insulator Disc	2		
23	1344-00750	Screw C'sk HD 4BA x ¾"LG	2		BS A37'B24
		St. St. to BS970 EN 57'58			
24					

FERRANTI LTD. EDINBURGH

CHARGE No.....

DATE ISSUED.....

No. OFF.....

AUTHORISED BY.....

DATE REQUIRED.....

STORES No.....

ACTIONED BY STOCK CONTROL.....

ISSUED BY & DATE.....

RECEIVED BY & DATE.....

ISSUE	DATE	MOD.	ISSUE	DATE	MOD	ISSUE	DATE	MOD
A	28.3.68	20915						
B	21.10.68	21470						
C	13-8-70	22963						

DRN W.S... DATE ...68

TRCD.

CHKD.

TITLE
SECONDARY STABILISER
TYPE 15906

SHEET OF 12 SHEETS

ISSUE/PARTS LISTS FOR - D3913/15906

BATCH

FIRST USED ON DRAWING PART LIST No.	ITEM	DRG./CODE No.	DESCRIPTION & SPECIFICATION	QTY REQ'D	TOTAL QTY REQ'D	REMARKS
	25	21344-00736	Screw C'sk HD. 4BA x $\frac{3}{8}$"LG	8		BS A37'[illegible]
			St. St. to BS970 EN57'58			
	26		Screw self tapper			[illegible]pt.[illegible]"
			6-32UNC C'sk HD x $\frac{1}{4}$"LG			
	27		Screw self tapper	4		
			6-32UNC pan HD x $\frac{1}{4}$"LG			"[illegible]"
	28					
	29					
	30	21324-00747	Screw CH.HD. 4BA x $\frac{1}{2}$"LG	20		BS A37'B16
			St. St. to BS 970 EN57'58			
	31	2134-00739	Screw CH.HD 6BA x $\frac{5}{8}$"LG	2		BS A37'A20
			St. St. to BS970 EN57'58			
	32	2134-00745	Screw CH.HD 4BA x $\frac{3}{8}$"LG	8		BS A37'B12
			St.St. to BS970 EN57'58			
	33	2134-00733	Screw CH.HD 6BA x $\frac{1}{4}$"LG	4		BS A37'A8
			St.St. to BS970 EN57'58			
	34	21344-00740	Screw C'sk HD. 6BA x $\frac{3}{4}$"LG	2		BS A37'A24
			St.St. to BS970 EN57'58			
	35	21324-00749	Screw CH.HD. 4BA x $\frac{3}{8}$"LG	12		BS A37'B20
			St.St. to BS970 EN57'58			
	36		Screw Fillester head	4		BS 4185
			10-32UNF x $\frac{3}{8}$"LG St.St. toBS970 EN57'58			
	37	21257-00643	Hammer drive screws	2		G.K.N.
			size 'oo' x 3/16"LG			No.4630

FERRANTI LTD. EDINBURGH

CHARGE No.	AUTHORISED BY	ACTIONED BY STOCK CONTROL
DATE ISSUED	DATE REQUIRED	ISSUED BY & DATE
No. OFF	STORES No	RECEIVED BY & DATE

ISSUE	DATE	MOD	ISSUE	DATE	MOD	ISSUE	DATE	MOD
A	25.7.68	2991						
B	2.10.68	3170						
C	13-2-70	3783						

DRN W.Sutherland
DATE 7.7.68
TRCD.
CHKD.

TITLE	SHEET	ISSUE/PARTS LISTS FOR -	BATCH
SECONDARY STABILISER TYPE 15908	OF SHEETS	D3913/15908	

FIRST USED ON DRAWING PART LIST No.	ITEM	DRG./CODE No.	DESCRIPTION & SPECIFICATION	TOTAL REQD.	TOTAL REQD.	
	38	21172-00424	Washer small 4BA St.St.	4		BS SP [illegible]
	39	21172-00425	Washer small 2BA St.St.	18		BS SP [illegible]
	40	21173-00601	Washer small ¼UN St.St.	3		BS [illegible]
	41					
	42	21183-00612	Washer crinkle 6BA	6		BS 3402
	43	21183-00613	Washer crinkle 4BA	2		BS 3402
	44	21183-00614	Washer crinkle 2BA	2		BS 3402
	45	21183-00615	Washer crinkle ¼	12		BS3401
	46					
	47	21386-00121	Stiffnuts thin 6BA	2		AGS2002'A'2
			St.St. to BS970 EN57'58			
	48					
	49	21382-00445	Nut ordinary 4BA St.St.	34		BS A19'B
			To BS 970 EN57'58			
	50	21382-00444	Nut ordinary 6BA St.St.	4		BS A19'A
			To BS 970 EN57'58			
	51	21382-00431	Nut 6BA thin St.St. to	2		BS A50'A
			BS970 EN57'58			
	52	25274-00346	Cable clip NX3	1		Insuloid

FERRANTI LTD. EDINBURGH

CHARGE No.	AUTHORISED BY	ACTIONED BY STOCK CONTROL
DATE ISSUED	DATE REQUIRED	ISSUED BY & DATE
No. OFF	STORES No.	RECEIVED BY & DATE

ISSUE	DATE	MOD	ISSUE	DATE	MOD	ISSUE	DATE	MOD
A	26.3.68	20915						
B	21.10.68	21470						
C	13.8.70	22973						

DRN W.Sutherland DATE 27.2.68

TRCD.

CHKD.

TITLE	SHEET	OF	ISSUE/PARTS LISTS FOR -	BATCH
SECONDARY STABILISER TYPE 13908	3	12 SHEETS	D3913/13908	

ON DRAWING PART LIST No.						
				PER ASSY	QTY REQ'D	
53	25236-[illegible]	Cable clip type NXO		1		[illegible]
54	28455-00677	Mica Washer		12		F[illegible]
		Type 43'14016				
55	28455-00678	Bush PTFE		9		Ferranti Ltd
		Type 43'14017				
56	25231-[illegible]	Type NX 14 high duty		4		[illegible]
		Cable clip				
57	1815-00.01	Rubber sheet grade		AS read.		
		C4 to BS 2752				
58	25185-00121	Polytag style 1 cat.		64		AEI
		No. PT1				
59	25234-042	Cable clip NX1		2		Insuloid
60	28143-676	Apparatus fixing block		6		I.S.E.P.
		Type CFB'1				
61	26682-111	Condenser clamp		1		RCL(Prov)Ltd
		CCL1-A				
62	25417-533	Fuse holder panel		1		Belling Lee
		Mounting L1382				
63	25411-409	Fuse Link 2A		2		Belling Lee
64	25411-807	Fuse anti surge		1		Radio Spares
		1¼"LG x 1.5A				
65	25411-809	Fuse anti surge		1		Radio Spares
		1¼"LG x 3A				

FERRANTI LTD. EDINBURGH

CHARGE No.	AUTHORISED BY.	ACTIONED BY STOCK CONTROL
DATE ISSUED.	DATE REQUIRED.	ISSUED BY & DATE
No. OFF.	STORES No.	RECEIVED BY & DATE

ISSUE	DATE	MOD	ISSUE	DATE	MOD	ISSUE	DATE	MOD
A	[illegible]	[illegible]						
B	[illegible]	[illegible]						
C	[illegible]	[illegible]						

DRN W. [illegible] DATE [illegible]
TRCD.
CHKD.

TITLE	SHEET 1 OF 12 SHEETS	ISSUE/PARTS LISTS FOR :-	BATCH
SECONDARY STABILISER TYPE 15908		D3913/15908	

ON DRAWING PART LIST No.	ITEM	DRG./CODE No.	DESCRIPTION & SPECIFICATION	QTY REQ'D	BY	REMARKS
	66	25184-322	Grommet Rubber 3/16" I/D	2		BS SP
	67	25184-321	Grommet Rubber 1/4" I/D	2		BS SP
	68	26682-212	Capacitor Clamp 1"Dia CCL4-B	2		
	69	26682-213	Capacitor Clamp 1 3/8"Dia CCL4-C	1		
	70					
	71	25221-176	Solder tag 2BA G369	16		Tucker
	72	25221-171	Solder tag 4BA G363	18		Tucker
	73		Solder Tag Star 2BA	1		Ross Courtney
			No. 388			
	74					
	75		4mm socket ref 4S'S	1		Oxley
			Blue			
	76		4mm socket ref 4S'S	1		Oxley
			black			
	77					
	78	26431-00449	6 Way socket MK4 brass	2		Plessey
			Fixed 508'1'40648'520			SKTA SKTC
	79		6 Way socket MK4 brass	1		Plessey
			Fixed 508'1'40648'521			SKTB
	80		Meter concord range type	1		Ander
			C155 full scale deflection			MI
			scale 'B' caption 'MA' 0-200			

FERRANTI LTD. EDINBURGH

CHARGE No.	AUTHORISED BY	ACTIONED BY STOCK CONTROL
DATE ISSUED	DATE REQUIRED	ISSUED BY & DATE
No. OFF	STORES No.	RECEIVED BY & DATE

ISSUE	DATE	MOD.	ISSUE	DATE	MOD.	ISSUE	DATE	MOD.
A	28.3.68	20915						
B	21.10.69	21470						
C	13-8-70	22962						

DRN W. Sutherland DATE 27.2.68
TRCD.
CHKD

TITLE	SHEET	ISSUE/PARTS LISTS FOR :-	BATCH
SECONDARY STABILISER TYPE 15908	5 OF 12 SHEETS	D3913/15908	

ON DRAWING PART LIST No.	ITEM	DRG./CODE No.	DESCRIPTION & SPECIFICATION	PER ASSY	QTY REQ	REMARKS
	81		Handles DEE 7" CRS	2		Zelo
			Type H5			
	82	25217-00073	Flexible terminal block	1		Belling Lee
			5 way ref. 1639B			
	83	25227-00217	Terminal screw stem	2		
			Type L1001'21'SB Blue			O'P3 O'P4
	84	25227-00215	Terminal screw stem	1		Belling Lee
			Type L1001'21SB Red			O'P1
	85	25227-00216	Terminal screw stem	1		Belling Lee
			Type L1001'21SB Black			O'P2
	86	25464-00502	Toggle switch single	4		NSF
			Throw type 8280'K15			SA, SB, SC, SF
	87	25463-00602	Toggle switch 3 POLE SINGLE	1		NSF
			Throw type 7611'K2			SE
	88	25464-00504	Toggle switch single	1		NSF
			Throw type 8370'K8 or			SD
		25463-00602	Toggle switch 3 pole			
			single throw type 7611'K2			
			Sleeving PTFE Thin Wall .024I/D			BS2848 type 6 class 250T
	89	1827-00768	Red	As reqd		
	90	1827-00763	Green	As reqd		
	91	1827-00772	White	As reqd		
	92	1827-00769	Black	As reqd		
			Transformers			
	93		Converter Drive	2		Ferranti
			Transformer RD11108			T1, T3

FERRANTI LTD. EDINBURGH

CHARGE No	AUTHORISED BY	ACTIONED BY STOCK CONTROL
DATE ISSUED	DATE REQUIRED	ISSUED BY & DATE
No OFF	STORES No	RECEIVED BY & DATE

ISSUE	DATE	MOD	ISSUE	DATE	MOD	ISSUE	DATE	MOD
A	13-8-70	103						

DRN W.Sutherland DATE 16.3.70
TRCD
CHKD

TITLE	SHEET	ISSUE/PARTS LISTS FOR -	BATCH
SECONDARY STABILISER TYPE 15908	6 OF 12 SHEETS	D3913/15908	

ON DRAWING PART LIST No.	DRG/CODE No.	DESCRIPTION & SPECIFICATION	PER ASSY	QTY REQ'D.	REMARKS
94		Converter Output	1		Ferranti T
		Transformer RD11109			
95		Converter Output	1		F
		TRANSFORMER RD1110			
96					
97					
98					
99		SELF ADHESIVE			
		MELINEX TAPE			
		Resistors			Electrosil
100		TR4 10Ω ± 5%	8		
101	26411-243	TR5 560Ω ± 5%	1		Electrosil R15
102	26411-247	TR5 820Ω ± 5%	1		Electrosil R10
103	26218-349	W.22 RFH3-6 1K ± 5% 6W	4		Welwyn R1,2,17,18
104	26411-251	TR5 1.2K ± 5%	1		Electrosil R12
105	26411-253	TR5 1.5K ± 5%	1		Electrosil R9
106	26411-257	TR5 2.2K ± 5%	1		Electrosil R14
107	26411-249	TR5 1K ± 5%	2		Electrosil R7,8
108	26411-265	TR5 1.7K ± 5%	2		Electrosil R13,16
109	26411-273	TR5 10K ± 5%	1		Electrosil R11
110	26216-00711	RWV4-L 470Ω 6W 5%	1		R 0
111	26218-00141	RFH-3 2.5 150Ω 5%	2		
112					
113					

FERRANTI LTD. EDINBURGH

CHARGE No.....	AUTHORISED BY.....	ACTIONED BY STOCK CONTROL.....
DATE ISSUED.....	DATE REQUIRED.....	ISSUED BY & DATE.....
No OFF.....	STORES No.....	RECEIVED BY & DATE

ISSUE	DATE	MOD	ISSUE	DATE	MOD	ISSUE	DATE	MOD
A	12-8-70	1763						

DRN W.Sutherland DATE 12.8.70
TRCD
CHKD

TITLE	SHEET	ISSUE/PARTS LISTS FOR -	BATCH
SECONDARY STABILISER TYPE 15908	7 OF 12 SHEETS	D3913/15908	

ON DRAWING PART LIST No.	ITEM	DRG/CODE No.	DESCRIPTION & SPECIFICATION	PER ASSY	QTY REQ'D	REMARKS
			Resistors Variable			
	114	26315-531	Carbon potentiometer	2		Plessey
			Type 'M' ⅜" Spindle			
			Screwdriver slot			
			1K ± 10%			
			Capacitors			
	115	26587-675	Electrolytic 80µF	1		Mallard
			25V DC C428'AR'E50			
	116	26522-414	Electrolytic 60µF	4		C9,10,13,14
			450V DC			
	117	26522-413	Electrolytic 32µF	2		C11, 1
			450V DC			
	118	26511-00156	Paper Dielectric	2		Dub. Lior
			0.1µF ± 20% 1500V DC			C ..6
			Type N265			
	119	26587-782	Electrolytic 64V DC	2		Mu..
			50 ± 10% C431'BR'H500			C ..
	120					
	121	26587-421	Electrolytic CE USD	2		TCC
			with sleeve 250µF 50V			C3, 4
	122	26511-451	Metalmite CP34H	4		TCC
			0.5µ 200V DC			C1,23,26,27
	123	26587-782	Electrolytic 500µF	1		Mallard
			64DC C431'BR'H500			C24

FERRANTI LTD. EDINBURGH

CHARGE No.	AUTHORISED BY	ACTIONED BY STOCK CONTROL
DATE ISSUED	DATE REQUIRED	ISSUED BY & DATE
No. OFF	STORES No.	RECEIVED BY & DATE

ISSUE	DATE	MOD.	ISSUE	DATE	MOD.	ISSUE	DATE	MOD.
A	13-2-70	42						

DRN. W. Sutherland DATE 10.2.70
TRCD.
CHKD.

TITLE	SHEET	ISSUE/PARTS LISTS FOR :-	BATCH
SECONDARY STABILISER TYPE 15908	8 OF 12 SHEETS	D3913/15908	

ON DRAWING PART LIST No.	ITEM	DRG./CODE No.	DESCRIPTION & SPECIFICATION	PER ASSY	QTY REQ'D.	REMARKS
	[illegible]	26587-680	Electrolytic 50μF	1		M[illegible]
			40V DC Type C428'AR'G50			C[illegible]
			Diodes			
	125	28457-461	ZR 10	[illegible]		D1,[illegible]
	126	28457-[illegible]61	ZR 200	8		D[illegible]9 I[illegible]
	127	28457-466	K$ 36A	2		ZD[illegible]
	128	28471-040	Z5D 560CF	1		ZD5
	129					
	130					
			Transistors			
	131	28463-430	2N 3441	4		Q3,4,5,6
	132	28463-429	2N 3442	4		Q[illegible],[illegible],[illegible]
	133	28463-265	2N 1486	1		Q12
	134	28463-432	ZT 65	2		Q7,8
	135	28461-207	2N 930	2		Ferranti Q17,[illegible]C
	136					
	137					
	138					
	139					
			Wire Electrical Equip			
	140	1348-010	Min. Elec. Cable No.3C	As reqd		DEF 10
	141	1347-471	Type 9442Y (2C)	As reqd		B[illegible]C
	142		Green/Red 14/.0076	As reqd		
	143					

FERRANTI LTD. EDINBURGH

CHARGE No.	AUTHORISED BY	ACTIONED BY STOCK CONTROL
DATE ISSUED	DATE REQUIRED	ISSUED BY & DATE
No. OFF	STORES No.	RECEIVED BY & DATE

ISSUE	DATE	MOD.	ISSUE	DATE	MOD.	ISSUE	DATE	MOD.
A	13-8-[illegible]65							

DRN W.S. [illegible]
DATE [illegible].4.70
TRCD.
CHKD.

TITLE	SHEET	ISSUE/PARTS LISTS FOR :-	BATCH
SECONDARY STABILISER TYPE 15908	9 OF 12 SHEETS	D3913/15908	

ON DRAWING PART LIST No.	ITEM	DRG./CODE No.	DESCRIPTION & SPECIFICATION	PER ASSY	TOTAL QTY REQ'D	REMARKS
	144		Blue'White 14/.0076	As reqd		
	145		Blue'Black 14/.0076	As reqd		
	146		Blue'Orange 14/.0076	As reqd		
	147	1346-191	Type 2, 14/.0076 Pink	As reqd		2 - [illegible] - P
	148	1346-096	Type 2, 1/.024 White	As reqd		2 - G - W
	149	1346-182	Type 2, 14/.0076 Blue	As reqd		2 - G - U
	150	1346-101	Type 2, 1/.024 Pink	As reqd		2 - 2 - P
	151	1346-185	Type 2, 14/.0076 Black	As reqd		2 - G - BK
	152	1346-181	Type 2, 14/.0076 Red	As reqd		2 - G - R
	153	1346-188	Type 2, 14/.0076 Violet	As reqd		2 - G - V
	154	1346-183	Type 2, 14/.0076 Green	As reqd		2 - G - G
	155	1346-095	Type 2, 1/.024 Black	As reqd		2 - 2 - BK
	156	1861-265	Soft solder to BS219	As reqd		BS 4109
			Grade K 20 SWG			
			Activated resin flux			
			(3 core) to spec DTD 599			
			& BS441 type 1			
	157	1343-046	23SWG tinned copper wire	As reqd		
	158					
	159	1823-152	Thread PVC 0.75mm	As reqd		Duratube
			Dia black			
	160	28455-679	Boron nitride, mounting	2		Union Carbide Europa
			Wafer ref. H4001			
			Sleeves Identification			DEF 20
	161	25171-506	Type 'B' 1mm I/D Black x $\frac{1}{8}$"LG	As reqd		B10 BK0

FERRANTI LTD. EDINBURGH

CHARGE No.	AUTHORISED BY	ACTIONED BY STOCK CONTROL
DATE ISSUED	DATE REQUIRED	ISSUED BY & DATE
No. OFF	STORES No	RECEIVED BY & DATE

ISSUE	DATE	MOD.	ISSUE	DATE	MOD	ISSUE	DATE	MOD
A	13-2-70	17965						

DRN W. Sutherland DATE 16.3.70
TRCD.
CHKD.

TITLE	SHEET 10 OF 12 SHEETS	ISSUE/PARTS LISTS FOR :-	BATCH
SECONDARY STABILISER TYPE 15908		D3913/15908	

ON DRAWING PART LIST No.

ITEM	DRG/CODE No.	DESCRIPTION & SPECIFICATION	PER ASSY	QTY REQ'D	REMARKS
162	25172-106	Type B, 1mm I/D Brown x $\frac{1}{8}$"LG	As reqd		B10/BN
163	25172-206	Type B, 1mm I/D Red x $\frac{1}{8}$"LG	As reqd		B10/R
164	25172-306	Type B, 1mm I/D Orange x $\frac{1}{8}$"LG	As reqd		B10/O
165	25172-406	Type B, 1mm I/D Yellow x $\frac{1}{8}$"LG	As reqd		B10/Y
166	25174-006	Type B, 1mm I/D Green x $\frac{1}{8}$"LG	As reqd		B10/G
167	25174-106	Type B, 1mm I/D Blue x $\frac{1}{8}$"LG	As reqd		B10/B
168	25174-206	Type B, 1mm I/D Violet x $\frac{1}{8}$"LG	As reqd		B10/V
169	25174-306	Type B, 1mm I/D Slate x $\frac{1}{8}$"LG	As reqd		B10/S
170	25174-406	Type B, 1mm I/D White x $\frac{1}{8}$"LG	As reqd		B10/W
171	25174-511	Type B, 1.5mm I/D Black x $\frac{1}{8}$"LG	As reqd		B15/BK
172	25172-111	Type B, 1.5mm I/D Brown x $\frac{1}{8}$"LG	As reqd		B15/BN
173	25172-211	Type B, 1.5mm I/D Red x $\frac{1}{8}$"LG	As reqd		B15/R
174	25172-311	Type B, 1.5mm I/D Orange x $\frac{1}{8}$"LG	As reqd		B15/O
175	25172-411	Type B, 1.5mm I/D Yellow x $\frac{1}{8}$"LG	As reqd		B15/Y
176	25174-011	Type B, 1.5mm I/D Green x $\frac{1}{8}$"LG	As reqd		B15/G
177	25174-111	Type B, 1.5mm I/D Blue x $\frac{1}{8}$"LG	As reqd		B15/B
178	25174-211	Type B, 1.5mm I/D Violet x $\frac{1}{8}$"LG	As reqd		B15/V
179	25174-311	Type B, 1.5mm I/D Slate x $\frac{1}{8}$"LG	As reqd		B15/S
180	25174-411	Type B, 1.5mm I/D White x $\frac{1}{8}$"LG	As reqd		B15/W
181	25131-044	Cable sleeve helsyn	1		Bellermann
		H150 15mm I/D x $\frac{3}{4}$"LG			
182	25625-00221	Lampholder diffused	5		Bulgin
		D674/1/Orange			
183	25625-00220	Lampholder diffused	1		Bulgin
		D674/1/Red			
184	26515-00433	Lamp miniature LES (E5'8)12V 1w	6		Vitality Bulbs Ltd

FERRANTI LTD. EDINBURGH

CHARGE No.	AUTHORISED BY.	ACTIONED BY STOCK CONTROL
DATE ISSUED	DATE REQUIRED.	ISSUED BY & DATE
No. OFF.	STORES No.	RECEIVED BY & DATE

ISSUE	DATE	MOD.	ISSUE	DATE	MOD.	ISSUE	DATE	MOD.
A	13.2.70	33963						

DRN W. Sutherland DATE 16.3.70
TRCD.
CHKD

TITLE	SHEET 11 OF 12 SHEETS	ISSUE/PARTS LISTS FOR -	BATCH
SECONDARY STABILISER TYPE 15908		D3913 15908	

ON DRAWING PART LIST No.

ITEM	DRG./CODE No.	DESCRIPTION & SPECIFICATION	PER ASSY	QTY REQ'D.	REMARKS
		Sleeves Binding			
185	25132-013	1.5mm I/D x $\frac{1}{2}$"LG A13	As reqd		Pack
186	25132-020	3mm I/D x 1"LG A30	As reqd		Pack
187	25132-025	5mm I/D x 1"LG A50	As reqd		Pack
188	25132-003	1mm I/D x $\frac{3}{8}$"LG A10	As reqd		Pack
189	1823-158	Nylon cord .031 Dia	As reqd		Blocks

FERRANTI LTD. EDINBURGH

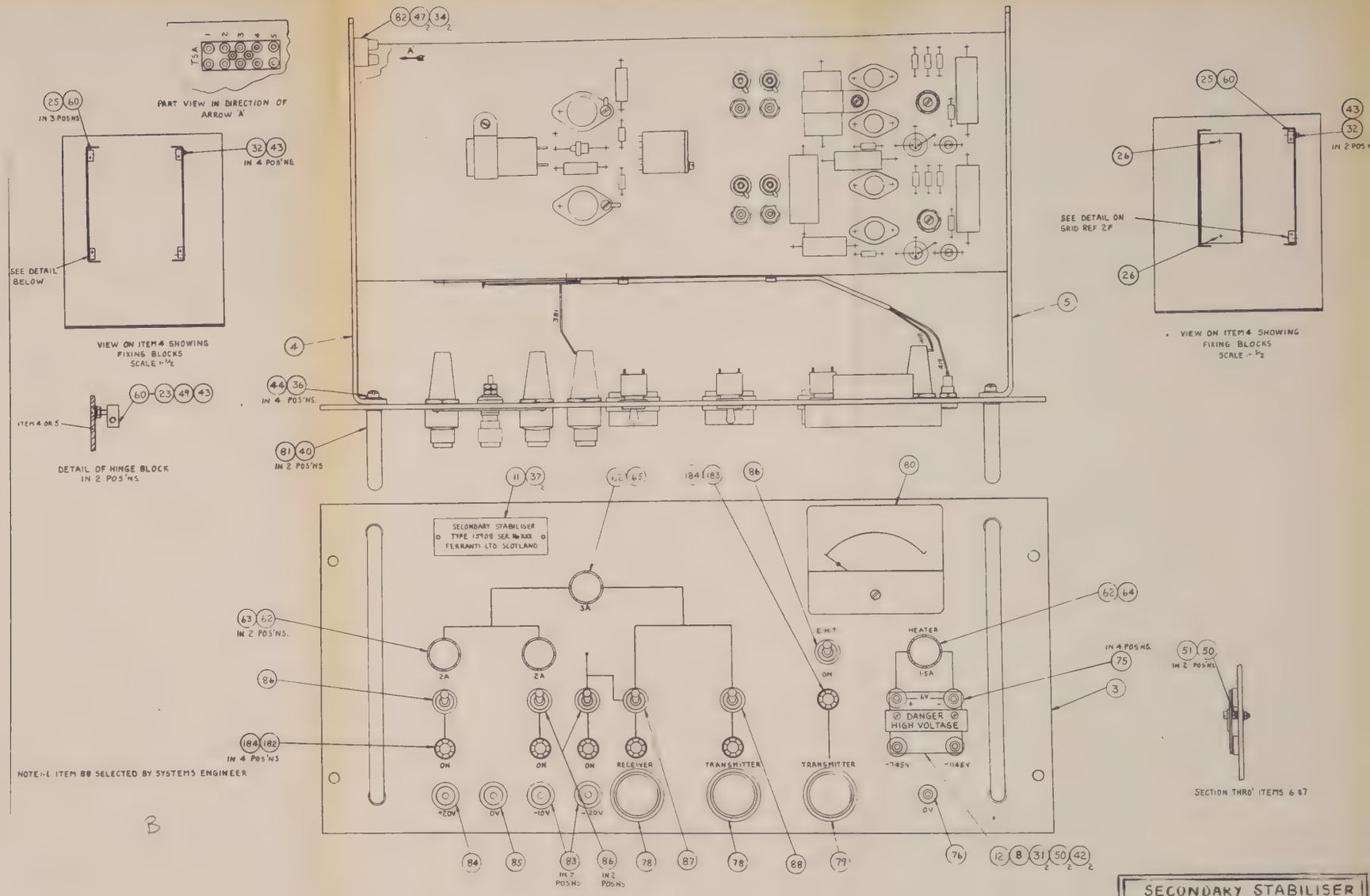
CHARGE No.	AUTHORISED BY	ACTIONED BY STOCK CONTROL
DATE ISSUED	DATE REQUIRED	ISSUED BY & DATE
No. OFF	STORES No.	RECEIVED BY & DATE

ISSUE	DATE	MOD.	ISSUE	DATE	MOD	ISSUE	DATE	MOD
A	12-2-71	2-5						

DRN W.S. Horton DATE 12.2.71
TRCD.
CHKD

TITLE	SHEET 12 OF 12 SHEETS	ISSUE/PARTS LISTS FOR -	BATCH
SECONDARY STABILISER TYPE 15908		D3913 15908	

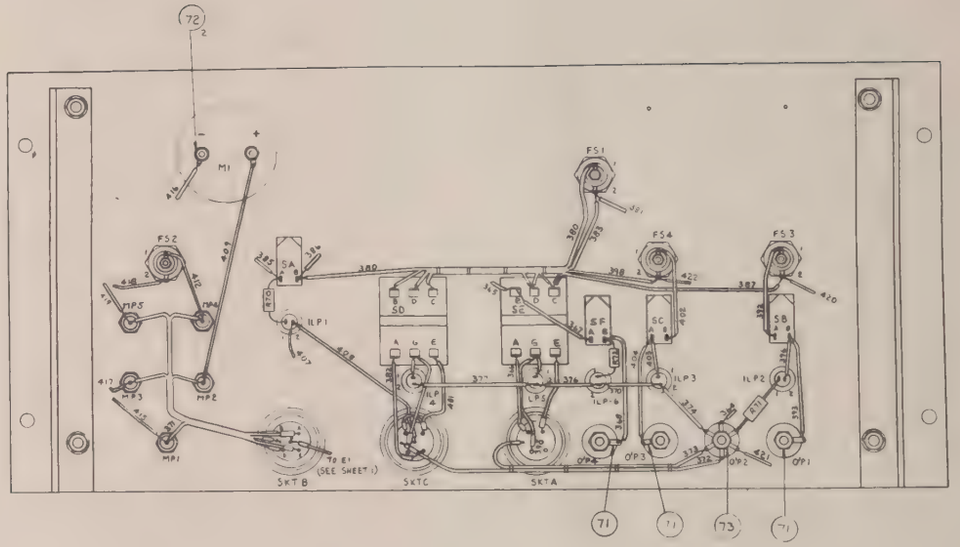
THIRD ANGLE PROJECTION



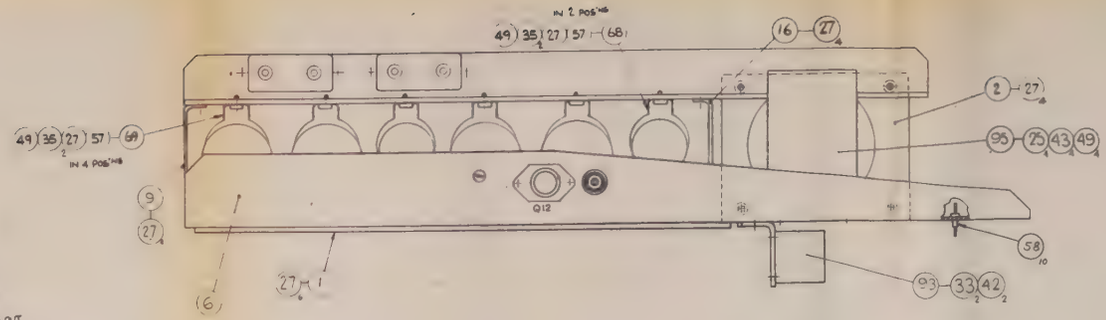
NOTE:- ITEM 88 SELECTED BY SYSTEMS ENGINEER

B

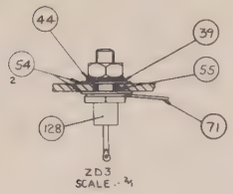
SECONDARY STABILISER
TYPE 15908
(SHT 1)

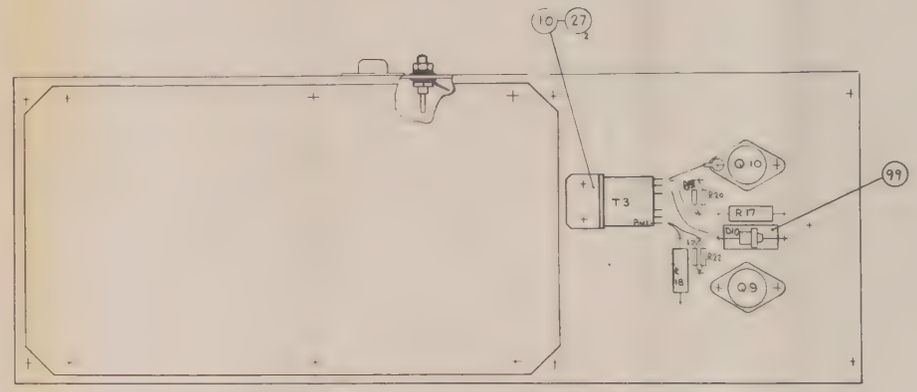


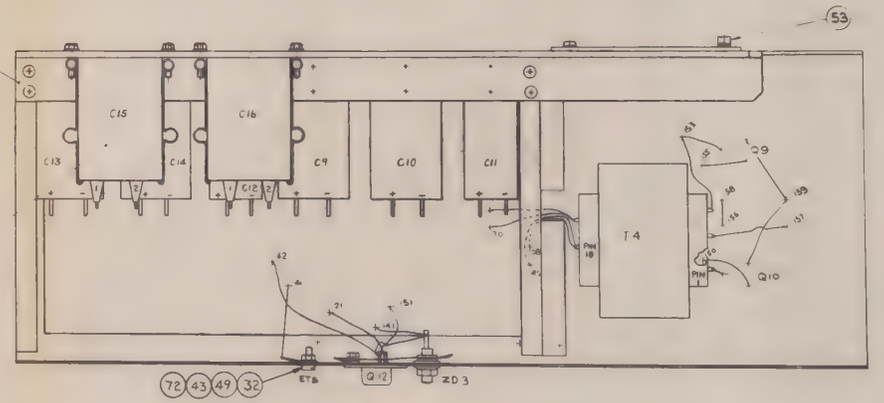
SECONDARY STABILISER
TYPE 15908
(SHI 2)

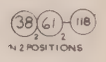


ITEMS 68 AND 69 TO BE OPENED OUT TO 1/8 DIA. & 1 3/8 DIA RESPECTIVELY, TAKING CARE TO KEEP LUGS PARALLEL





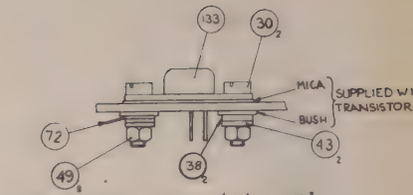




NOTES:-

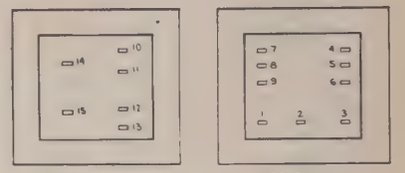
1. WIRING TO BE IN ACCORDANCE WITH INSTRUCTION SHEETS AS FOLLOWS:-

SOLDER JOINTS-	J31002
CABLE LACING-	W33000
SLEEVE IDENTIFICATION-	W33003



DETAIL OF FIXING OF ITEM 133 (Q12) SCALE 4/1

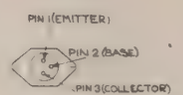
FIXING OF ITEMS 132 (Q9 & Q10) SIMILAR. NOTE MICA WAFER REPLACED BY ITEM 160, ITEM 72 IS 2-OFF (Q10 ONLY) USING EACH SIDE OF BOARD BUT ON SAME SCREW.



DETAIL OF CONNECTIONS ON T4 (ITEM 95)

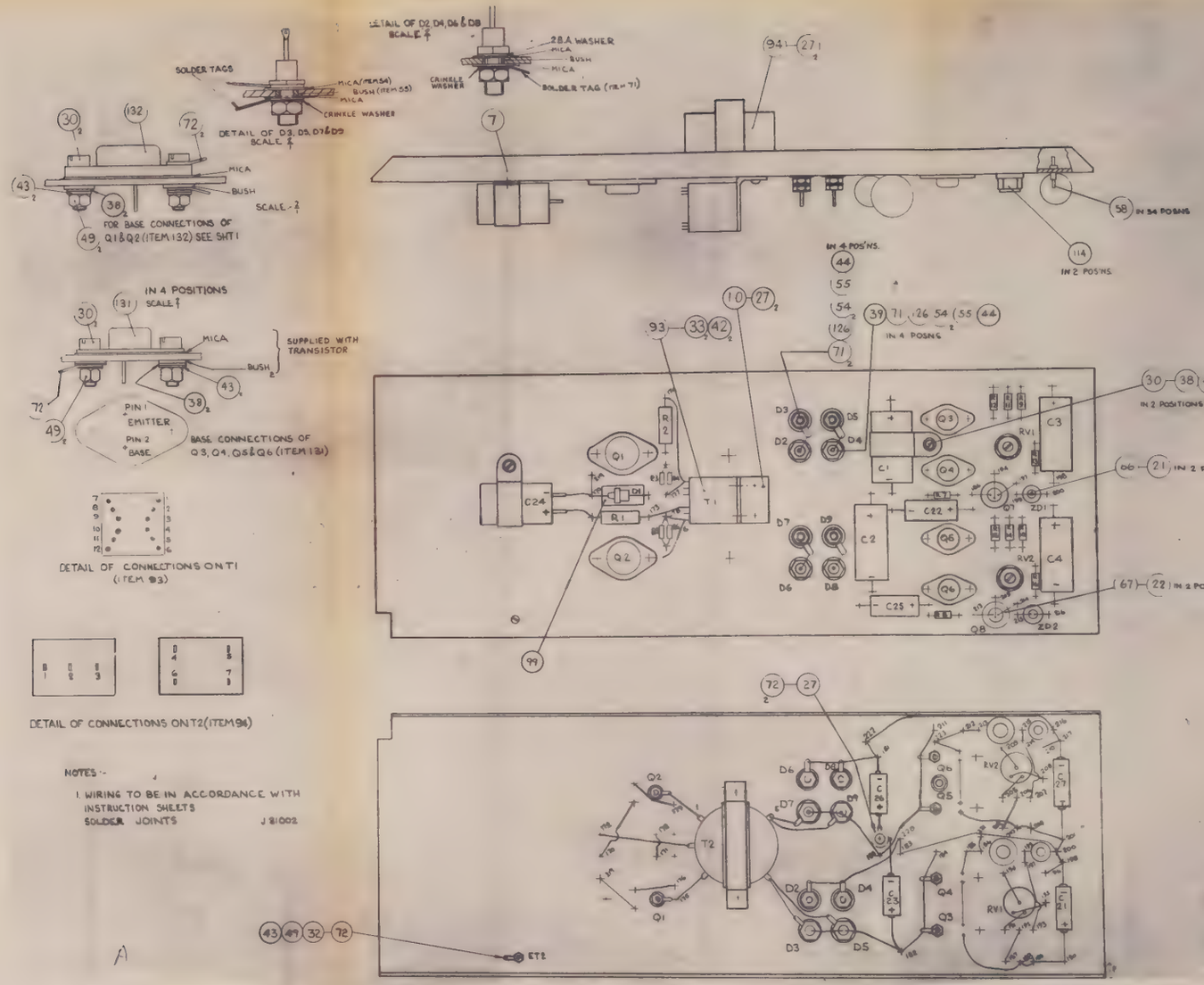
DETAIL OF CONNECTIONS ON T3 (ITEM 93)

DETAIL OF CONNECTIONS ON Q9 & Q10 (ITEMS 132)

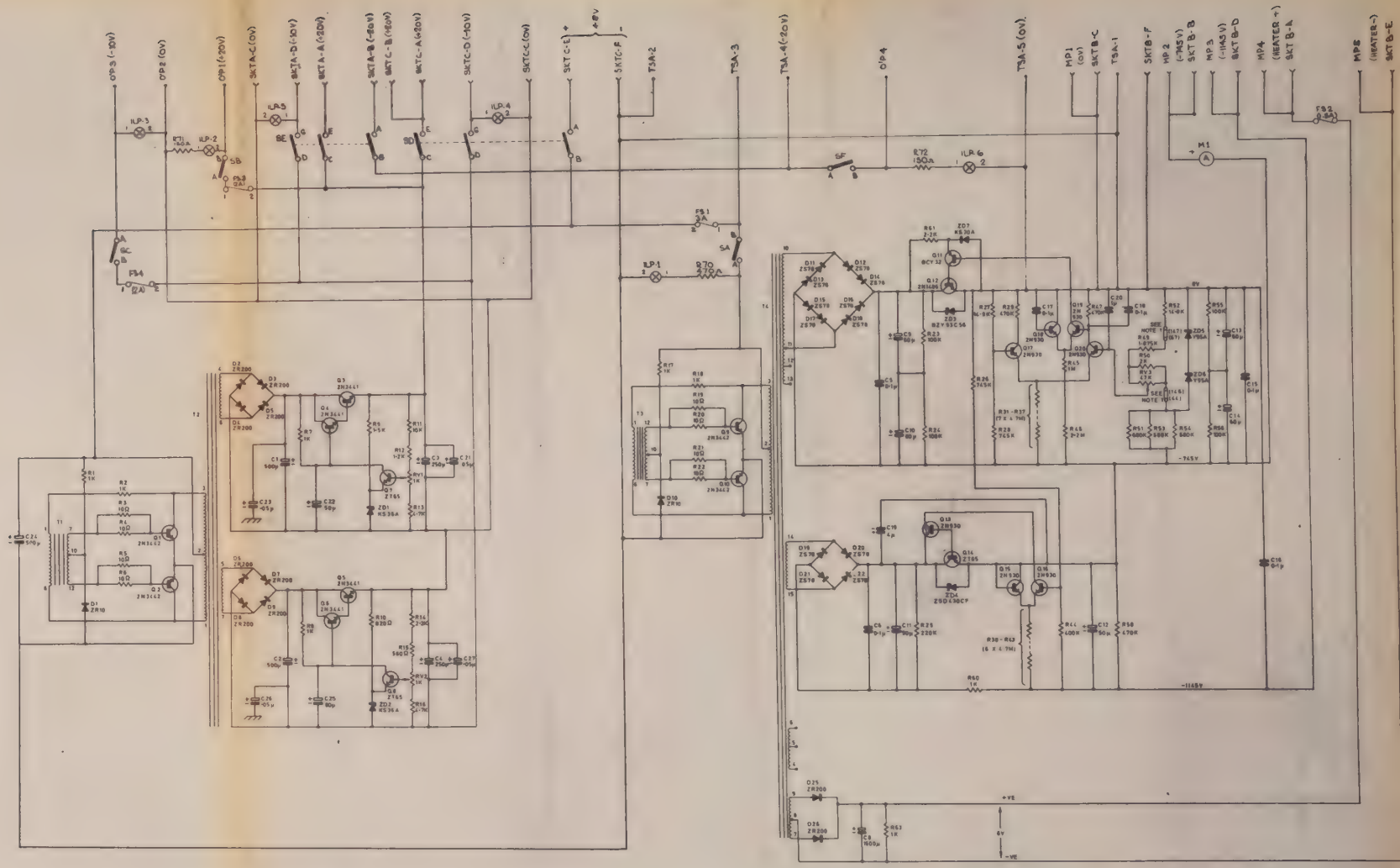


DETAIL OF CONNECTIONS ON Q12 (ITEM 133)

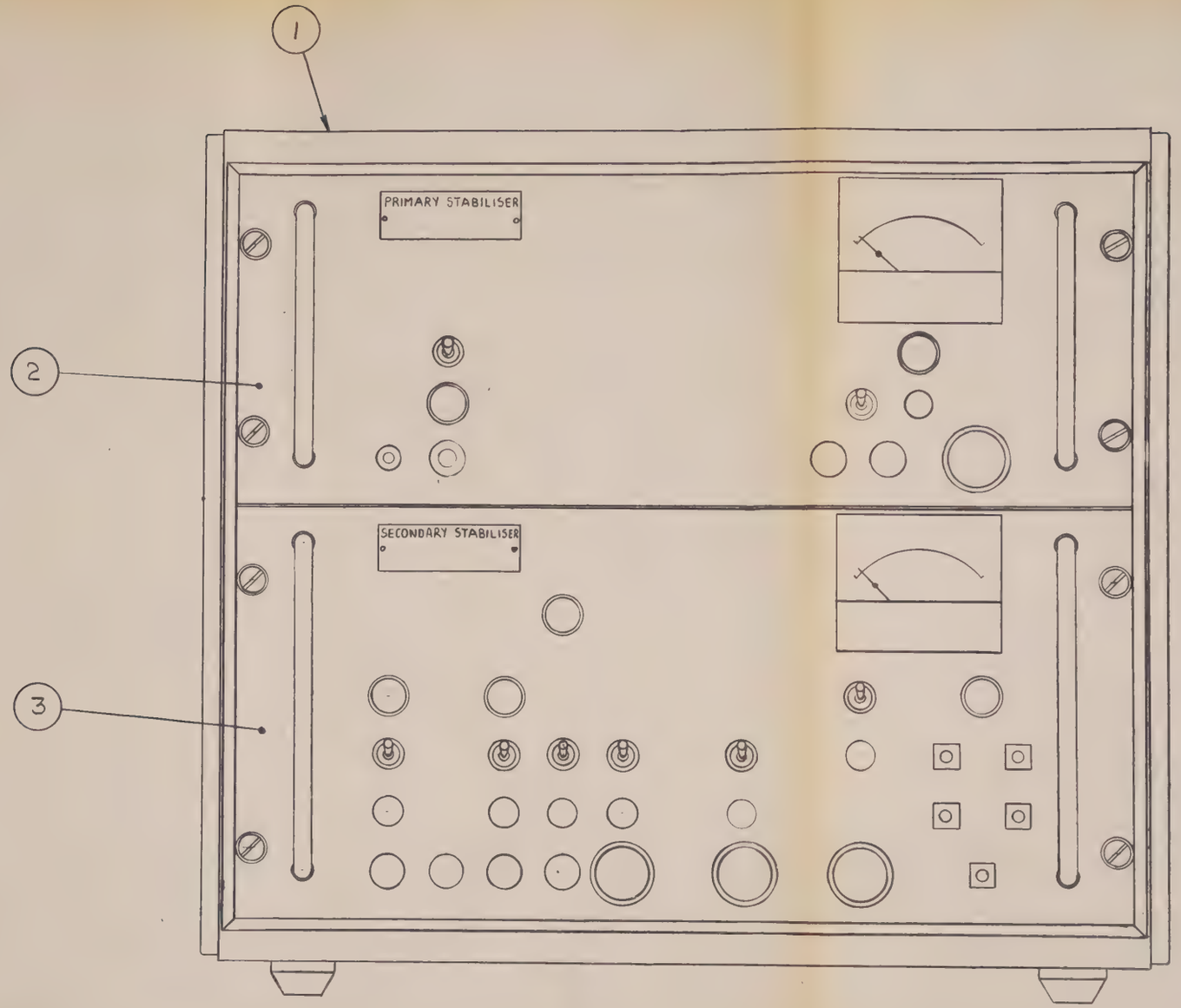
SECONDARY STABILISER
TYPE 15908
(SHT 3)

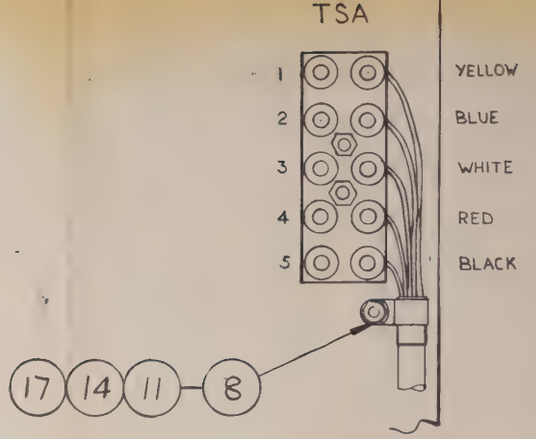


SECONDARY STABILISER
TYPE 1590B
(SHT. 4)



SECONDARY STABILISER
TYPE 15908
(SHT.5)





PART VIEW SHOWING CONNECTION FROM PRIMARY FLYING LEADS TO SECONDARY TSA.

WORKSHOP POWER SUPPLY
TYPE 15909

ITEM	DRAWING NO	NAME	NO OFF	REMARKS

MP MASTER
MA23423